

Applicant: Joerg HALLELDER et al.
Docket No. R.307554
Preliminary Amdt.

AMENDMENTS TO THE SPECIFICATION:

Page 1, please add the following new paragraphs before paragraph [0001]:

[0000.2] CROSS-REFERENCE TO RELATED APPLICATIONS

[0000.4] This application is a 35 USC 371 application of PCT/DE 2004/002552 filed on November 19, 2004.

[0000.6] BACKGROUND OF THE INVENTION

Please replace paragraph [0001] with the following amended paragraph:

[0001] ~~Prior Art~~ **Field of the Invention**

Please replace paragraph [0002] with the following amended paragraph:

[0002] The present invention relates to an automatic parking brake for keeping a vehicle parked[.]. ~~The present invention also relates and~~ to an improved method for actuating an automatic parking brake.

Please add the following new paragraph after paragraph [0002]:

[0002.5] Description of the Prior Art

Please replace paragraph [0004] with the following amended paragraph:

[0004] ~~Advantages of the Invention~~

SUMMARY AND ADVANTAGES OF THE INVENTION

Please replace paragraph [0005] with the following amended paragraph:

[0005] The automatic parking brake of the invention[.] ~~the characteristics of claim 1, has the advantage over the prior art that it makes a simple, economical construction possible. The automatic parking brake of the invention furthermore has no influence on the service braking, and in particular there is no additional increase in volume caused by the parking brake in a~~

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normal service braking event. This is attained according to the invention in that the automatic parking brake has a brake piston, an auxiliary piston, a hydraulic chamber disposed between the brake piston and the auxiliary piston, a spring element for prestressing the auxiliary piston, a spindle device connected to the auxiliary piston via a threaded connection, and a drive for the spindle device. The brake piston is preferably the same brake piston that is used by the service brake of the vehicle as well. In the locked state of the parking brake, the brake piston is mechanically locked via the spindle device and the spring-loaded auxiliary piston. In a released state of the parking brake, the auxiliary piston is fixed by means of the spring element and/or by means of the spindle device.

Page 2, please delete paragraph [0006].

Page 4, please replace paragraph [0016] with the following amended paragraph:

[0016] [[A]] The height of the first and second element of the stop is preferably less than one thread pitch of the spindle device. This reliably prevents the head of the spindle device from coming into contact with the housing component of the parking brake, where it could seize.

Page 5, please replace paragraph [0017] with the following amended paragraph:

[0017] The method according to the invention for actuating an automatic parking brake includes the steps of actuating the spindle device until it contacts the brake piston, then building up a hydraulic pressure in the hydraulic chamber between the brake piston and the auxiliary piston in order to move the brake piston in such a way that the brake is put in the

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locked state, and to move the auxiliary piston, connected to the spindle, in an opposite direction from the brake piston, as a result of which the spindle is spaced apart from the brake piston. In [[a]] the next step, the spindle device is actuated once again, until the spindle device again contacts the brake piston, so that the position of the brake piston is mechanically fixed via the spindle device and the auxiliary piston. Next, the hydraulic pressure in the hydraulic chamber is reduced. If the brake piston of the service brake of the vehicle is used as the brake piston of the parking brake, which is especially advantageous since in that case no additional components are necessary, then it is assured according to the invention that during the locking operation of the parking brake, only a certain hydraulic volume is employed. Once the parking brake is locked, the hydraulic pressure in the hydraulic chamber is reduced again, so that in the locked state of the parking brake, no hydraulic fluid from the brake circuit of the service brake has to be used. If settling effects occur at the components of the automatic parking brake after the pressure reduction in the hydraulic chamber, they can be compensated for by the spring that acts on the auxiliary piston. The spring furnishes a certain elasticity of the system. The spring is moreover designed such that if only a slight change in the length of the spring occurs, the spring force changes only minimally, if at all.

Page 8, please replace paragraph [0024] with the following amended paragraph:

[0024] Drawing **BRIEF DESCRIPTION OF THE DRAWINGS**

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Please replace paragraph [0025] with the following amended paragraph:

[0025] ~~One exemplary~~ Exemplary embodiments embodiment of the invention are is shown in the drawing and described in further detail in the ensuing description, taken in conjunction with the drawings, in which: [.] Shown in the drawing are:

Please replace paragraph [0026] with the following amended paragraph:

[0026] Fig. 1[.] a schematic sectional view of an automatic parking brake in a first exemplary embodiment of the present invention, in a state before the onset of a locking operation;

Page 9, please replace paragraph [0034] with the following amended paragraph:

[0034] Description of the Exemplary Embodiments

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please replace paragraph [0035] with the following amended paragraph:

[0035] In conjunction with Figs. 1-6, an automatic parking brake 1 in a first exemplary embodiment of the invention will first be described below.

Page 12, please replace paragraph [0045] with the following amended paragraph:

[0045] Once the maximum blocking current is ascertained, the electric motor is stopped and is operated in the opposite direction, to move the spindle 5 in the direction of the arrow R (see Fig. 2). In Fig. 6, the onset of the actuation of the spindle 5 in the opposite direction to arrow P is represented by the letter B. The spindle 5 rotates in the direction of the arrow R until it rests on the bottom of the blind bore [[2]] 2a. Since the auxiliary piston 3 rests on the

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housing region 11a, and a communication of the hydraulic chamber 4 with a hydraulic reservoir is interrupted, the spindle 5 cannot move any farther in the direction of the arrow R. As a result, the motor current consumed by the electric motor 13 increases to its maximum value again, as represented in Fig. 6 by the point at C. This state is shown in Fig. 2.

Page 14, please replace paragraph [0049] with the following amended paragraph:
[0049] The automatic parking brake can thus make the braking position of the brake piston 2 possible without using hydraulic fluid from the service brake circuit. Moreover, during the locking operation, the spindle 5 always rotates in the same direction of rotation, and therefore any play that may exist in the spindle upon a reversal of direction will not cause any deviation. Moreover, compensation [[for]] any lining wear that may occur in the brake can easily be compensated for by means of a lengthened spindle stroke. Because of the use of the spring element 7, there is also a certain elasticity of the system in the event of settling.

Page 17, please add the following new paragraph after paragraph [0057]:
[0058] The foregoing relates to a preferred exemplary embodiment of the invention, it being understood that other variants and embodiments thereof are possible within the spirit and scope of the invention, the latter being defined by the appended claims.